



IEI Technology Corp .



MODEL:

MMC-2201C Medical LCD Monitor

20.1" 2 MP DICOM Compliant Color TFT LCD Medical Monitor with 300 cd/m² Luminance, 800:1 Contrast Ratio and Selectable Gamma Calibration

User Manual

Rev. 1.00 APRIL 2008





Revision History

Date	Version	Changes
2008-04-08	1.00	Initial release

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Manual Conventions



WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:



WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the MMC-2201C or personal injury to the user. Please take warning messages seriously.



CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the MMC-2201C. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:



CAUTION:

MMC-2201C Medical LCD Monitor

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the MMC-2201C. Please take caution messages seriously.



NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:



NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the MMC-2201C. Please take note messages seriously.

Packing List

**NOTE:**

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the MMC-2201C from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

PACKING LIST

All the monitors in the MMC-2201C are shipped with the following components:

- 1 x MMC-2201C Medical LCD monitor
- 1 x Monitor stand
- 1 x Power Adapter
- 2 x Power Cords (1 x US, 1 x EU)
- 1 x DVI-D Signal Cable
- 1 x Utility CD-ROM
- 1 x VGA cable
- 1 x HW OSD Key for setup

If any of these items are missing or damaged, contact the distributor or sales representative immediately. Images of the above items are shown in **Section 4.1.3**

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Chapter

1

Introduction

1.1 MMC-2201C Medical LCD Monitor Overview



Figure 1-1: MMC-2201C Medical Monitor

The MMC-2201C Medical LCD (MMC-2201C) monitor is a high performance, 2 Megapixel medical grade color LCD monitor designed for the exacting needs of diagnostic professionals that provides clear and sharp images with resolutions of up to 1600 x 1200 pixels, 300 cd/m² brightness and 800:1 contrast ratio, making it ideal for diagnosing detailed medical graphics. The ergonomic design provides flexible four-way adjustments (lift, tilt, swivel and rotate) for ease of use and VESA mounting capabilities provide a wide array of mounting options. The MMC-2201C also uses a DVI digital interface, offering compatibility with the latest digital standards.

1.2 Features

Some of the standard features of the MMC-2201C include:

- OSD control with automatic portrait/landscape orientation detection
- DVI-D digital interface
- Low resolution support
- Wide viewing angle
- Full screen availability
- Slim bezel
- Anti-glare and low-reflection glass

MMC-2201C Medical LCD Monitor

- Standard VESA mounting interface
- Ergonomically designed stand
- Various graphics card support: Matrox, RealVision, ATI, nVidia and other high-level commercial cards



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Chapter

2

Mechanical Overview

2.1 Introduction

This chapter describes the general mechanical overview of the MMC-2201C monitors, including the front panel, external peripheral interface connector (EPIC) panel, available interfaces and overall dimensions.

2.2 Front Panel

The front panel of the MMC-2201C has an LCD screen surrounded by a sturdy acrylonitrile butadiene styrene (ABS) and polycarbonate (PC) plastic frame. The front panel is shown in **Figure 2-1**.



Figure 2-1: MMC-2201C Front Panel

MMC-2201C Medical LCD Monitor

2.3 Bottom Panel

The bottom panel of the MMC-2201C has an OSD control panel and power on/off LED. The bottom panel also has a series of interface connectors. The bottom panel is shown in Figure 2-2.



Figure 2-2: MMC-2201C Bottom Panel

2.4 Rear Panel

The rear panel of the MMC-2201C has standard VESA mounting holes and the monitor's external peripheral interface connector panel. The rear panel is shown in Figure 2-3.

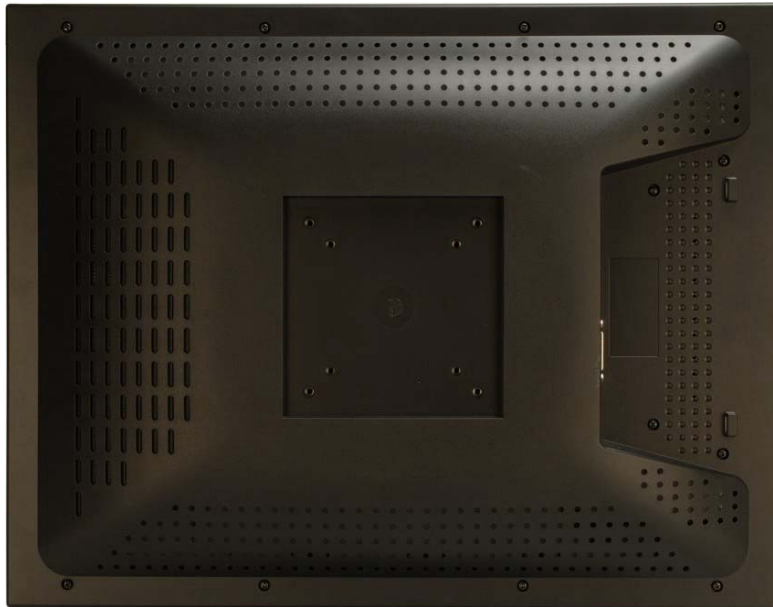


Figure 2-3: MMC-2201C Rear Panel

2.5 External Peripheral Interface Connector (EPIC) Panel

All the models in the MMC-2201C have the same connector interfaces on the rear panel.

The rear panel interface connectors are listed below and shown in **Figure 2-4**.

- 1 x Power connector
- 1 x DVI-D input connector
- 1 x VGA connector
- 1 x Component connector

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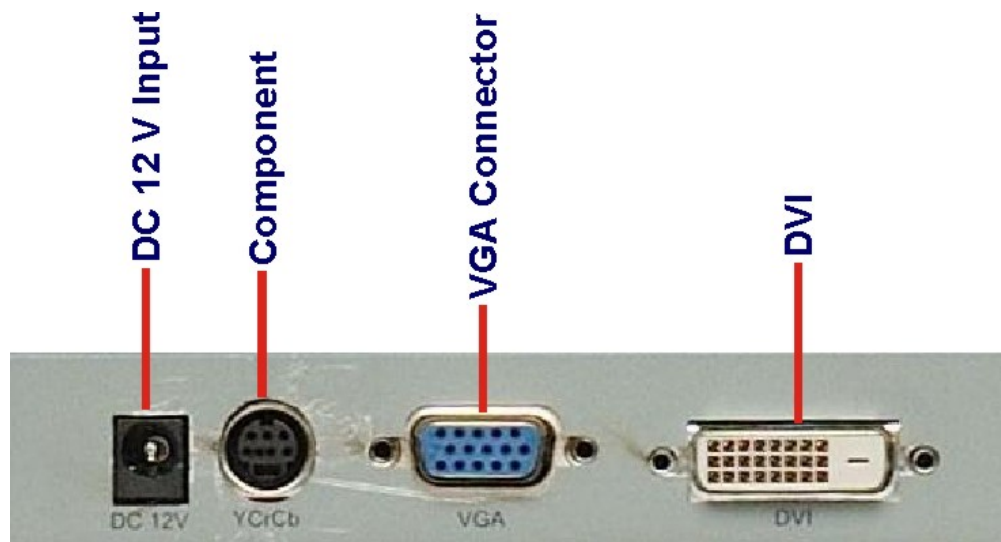


Figure 2-4: MMC-2201C EPIC Panel

2.6 Physical Dimensions

The physical dimensions of the MMC-2201C monitors are specified in Table 2-1 below.

	Portrait Orientation Without Stand	Portrait Orientation With Stand
Width (mm)	380	380
Height (mm)	485	520
Depth (mm)	100	274

Table 2-1: Physical Dimensions

2.6.1 MMC-2201C Dimensions (without stand)

The MMC-2201C dimensions (without stand) are shown in Figure 2-5 below.

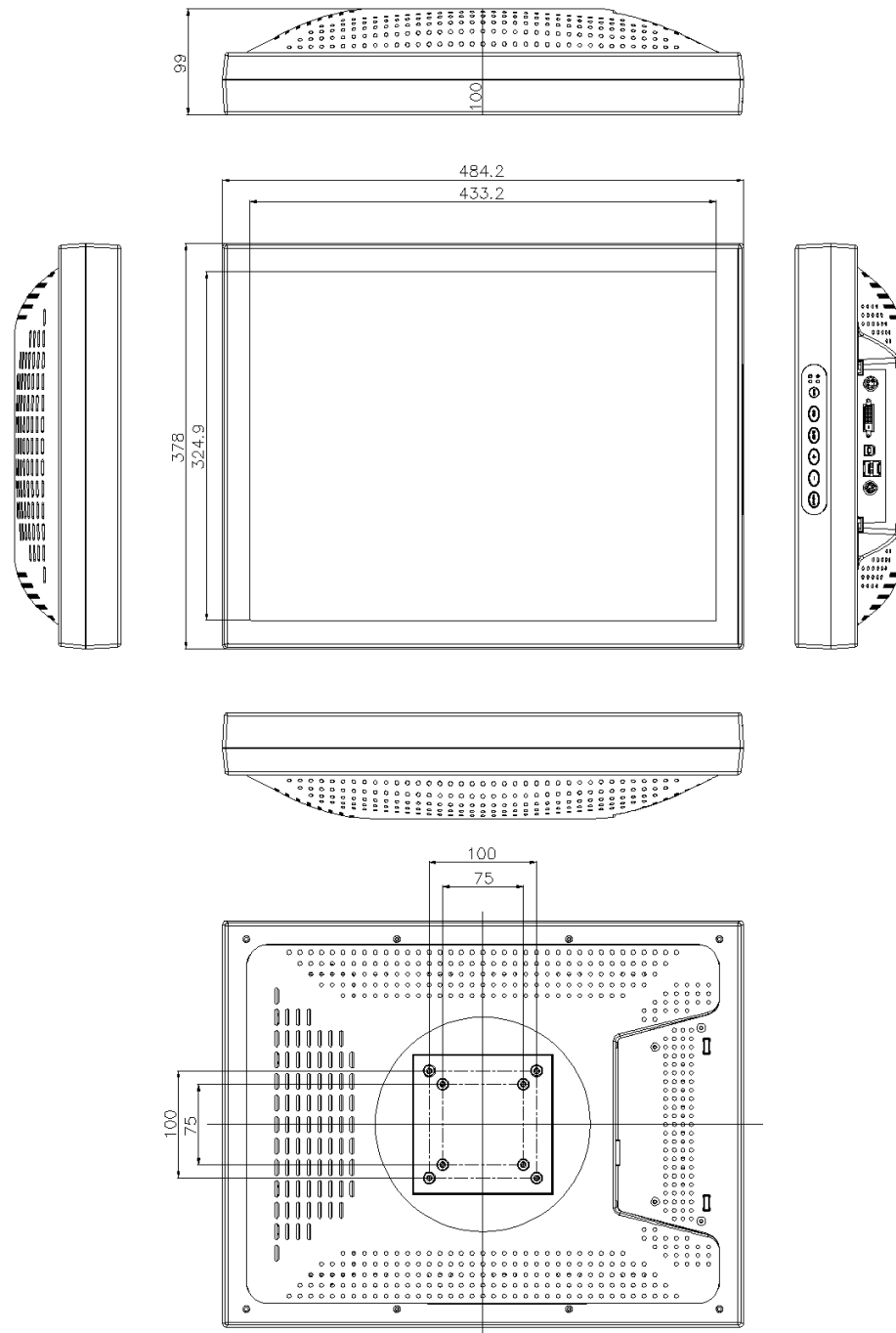


Figure 2-5: MMC-2201C Dimensions (without stand) (mm)

MMC-2201C Medical LCD Monitor

2.6.2 MMC-2201C Dimensions (with stand)

The MMC-2201C dimensions (with stand) are shown in **Figure 2-6** below.

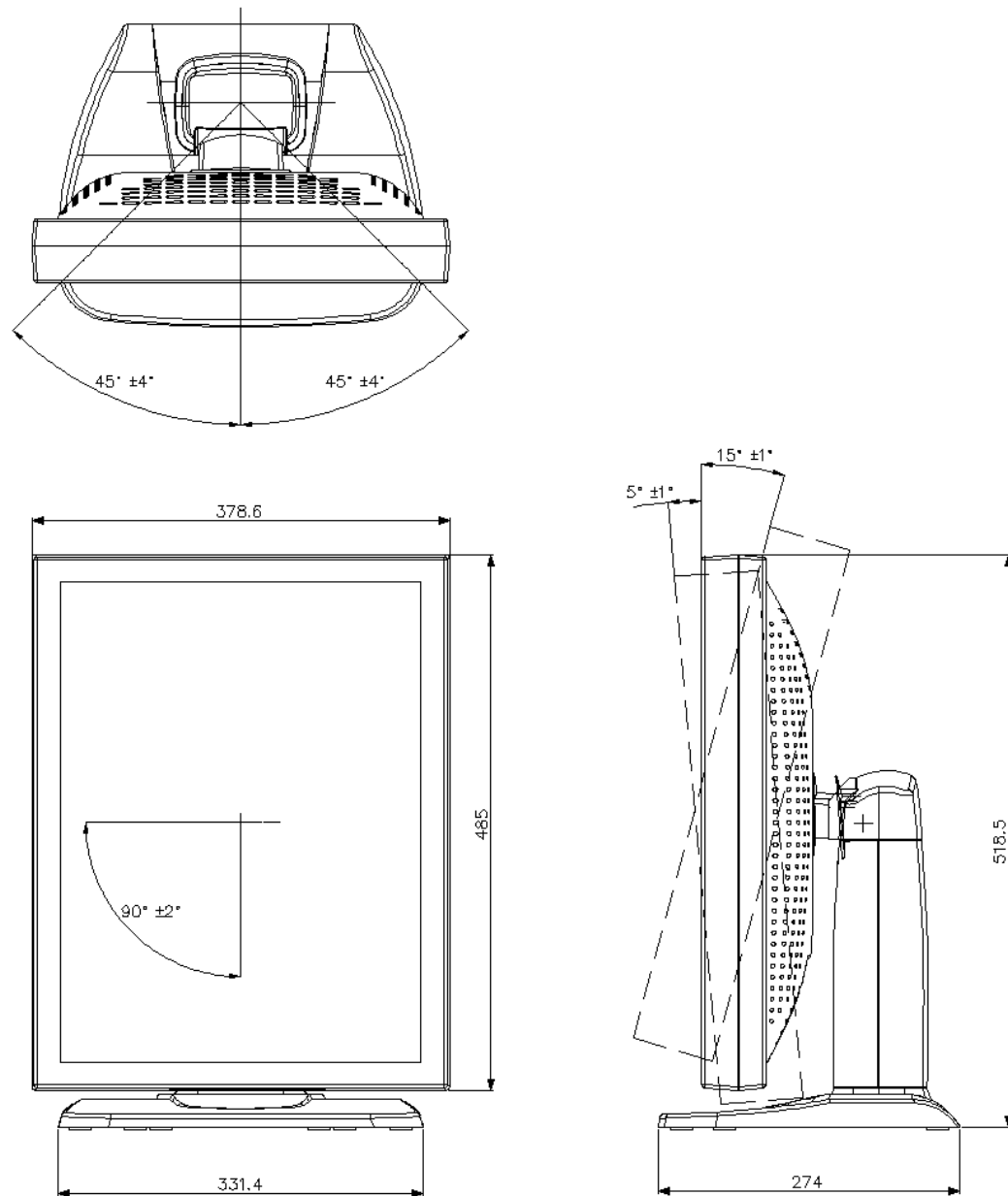


Figure 2-6: MMC-2201C Dimensions (with stand) (mm)

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Chapter

3

Specifications

3.1 General Specifications

The following sections describe the MMC-2201C specifications.

3.1.1 Color Monitors

Table 3-1 lists the specifications for the MMC-2201C.

MMC-2201C	MMC-2201C
Drive System	a-Si TFT active matrix
Display area (H x V) (mm)	398.4 x 298.8
Diagonal size of display	51 cm (20.1 inches)
Resolution (H x V)	1600 x 1200
Display color	16,777,216 colors
Pixel pitch (H x V) (mm)	0.255 x 0.255
Pixel format	RGB (Red dot, Green dot, Blue dot) vertical stripe
Luminance-max.	300 (cd/m²)
Contrast ratio	800:1 (typ.)
Viewing angle	Right 89°, Left 89°, Up 89°, Down 89°
Response time (Ton + Toff)	16 ms (typ.)
Polarizer surface/hardness	Antiglare/2H
Backlight	6 CCFL
Default gamma	Gamma 2.2
DICOM Calibration Preset	Yes
Signal input	Single link DVI-D (digital)
OSD	Yes
Power Adapter Input voltage range	100VAC-240VAC
Power Adapter Input frequency range	47 Hz-63 Hz
Power Adapter Max input AC current	1.25 A - 0.5 A
Power Adapter Power output	12 VDC, 8.33 A (max.), 100 W
Physical dimensions	With stand: 520 x 380 x 274 (portrait)

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MMC-2201C	MMC-2201C
(H x W x D) (mm)	Without stand: 485 x 380 x 100 (portrait)
Adjustable height range (with stand)	Portrait: 520 mm ~ 590 mm Landscape: 465 mm ~ 535 mm
Weight (without/with stand)	7.5 kg/12.0 kg
Operating temperature	+10°C ~ +35°C
Storage temperature	0°C ~ +45°C
Operation Relative Humidity	30% ~ 75% Non-condensing
Storage/Transportation Relative Humidity	10% ~ 95% Non-condensing

Table 3-1: MMC-2201C Color Monitor Specifications

3.1.2 Classification

- Power by Class I power adapter:
- No Applied Part.
- No protection against the ingress of water: IPX0
- Mode of operation: Continuous Operation
- The equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide: Not AP or APG Category:

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Chapter

4

Unpacking

4.1 Unpacking

4.1.1 Packaging

When shipped, the MMC-2201C is packed inside two cardboard boxes, secured in place and protected by six polyethylene spacers. A smaller cardboard box containing all accessory items is also placed within the two cardboard boxes.

4.1.2 Unpacking Procedure



CAUTION!

Be sure the box containing the MMC-2201C is placed in an upright position before opening it in order to prevent any of the contents from being damaged.

To unpack the MMC-2201C, follow the steps below:

- Step 1:** Use box cutters, a knife or a sharp pair of scissors to open the seal on the top of the external box.
- Step 2:** Open the internal box.
- Step 3:** Remove the small cardboard box containing the accessory items.
- Step 4:** Remove the right and left polyethylene spacers.
- Step 5:** Remove the center polyethylene spacer from the rear of the panel.
- Step 6:** Remove the front polyethylene spacer from in front of the panel.
- Step 7:** Lift the MMC-2201C out of the boxes.
- Step 8:** Remove any remaining polyethylene spacers from the panel.

MMC-2201C Medical LCD Monitor

Step 9: Make sure all the components inside the box of accessories and listed in the packing list are present.

4.1.3 Packing List



NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the MMC-2201C from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

When the MMC-2201C is received, make sure all the components listed below are present.









Quantity	Item	Image
1	MMD Series LCD monitor (with/without stand)	
1	DVI cable	
1	AC power adapter	
1	AC power cable (US)	
1	AC power cable (EU)	
1	Utility CD	
1	7-pin Mini-DIN to 3 BNC (P/N: 32000-113900-RS)	
1	VGA to 5 BNC (P/N: 32000-114500-RS)	

Table 4-1: Package List Contents

Chapter

5

Installation

5.1 Installation Precautions

When installing the MMC-2201C, please follow the precautions listed below:

- **Read the user manual:** The user manual provides a complete description of the MMC-2201C, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the monitor must be disconnected when installing the MMC-2201C. Electric shock and personal injury might occur if the rear panel of the monitor is accessed while the power cord is still connected to an electrical outlet.
- **Qualified Personnel:** The MMC-2201C must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Mounting:** The monitor is a heavy piece of equipment. Please ensure at least two people assist with mounting the monitor.
- **Air Circulation:** Make sure there is sufficient air circulation when installing the monitor. The monitor's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the monitor.

5.2 External Peripheral Interface Connectors

The external peripheral interface panel connectors for the MMC-2201C are listed below.

- 1 x Power connector
- 1 x DVI-D input connector
- 1 x VGA port
- 1 x Component connector

MMC-2201C Medical LCD Monitor

5.2.1 EPIC Panel Connectors Overview

Figure 5-1 shows the EPIC panel connectors for the MMC-2201C. The following sections fully describe EPIC panel connectors.

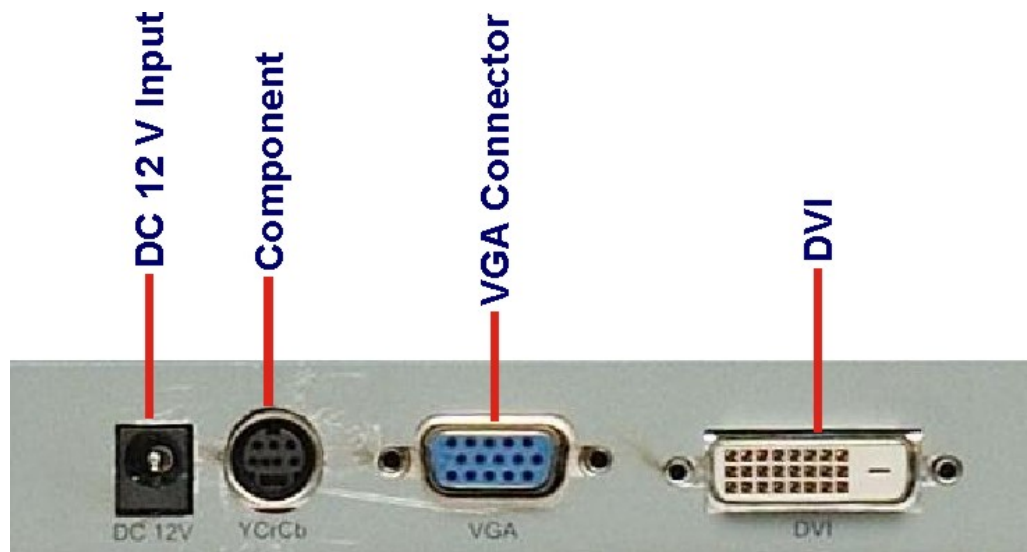


Figure 5-1: Monitor EPIC Panel Connectors

5.2.2 DC 12V Connector

Use the DC 12V connector to power the monitor.

PIN	DESCRIPTION
1	GND
2	GND
3	+12V

Table 5-1: DC 12V Connector Pinouts

5.2.3 DVI-D Connector

The 24-pin female dual link digital only DVI (Digital Visual Interface) connector is a standard for high-speed, high-resolution digital displays. Use the DVI-D connector to connect the LCD to a system.

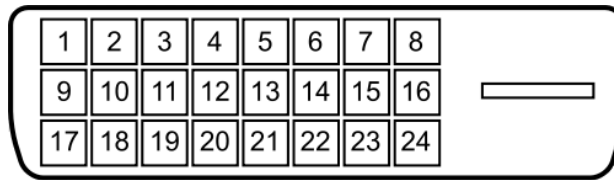


Figure 5-2: DVI-D Connector Pinout Locations

5.2.4 VGA Connector

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

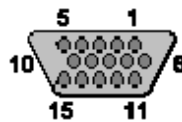


Figure 5-3: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 5-2: VGA Connector Pinouts

5.2.5 Component Video Connector

Use the mini-DIN 7 component video connector to connect to the system graphics interface.

MMC-2201C Medical LCD Monitor



Figure 5-4: Component Video Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VGND	5	VGND
2	Pb	6	Pr
3	VGND	7	VGND
4	Y		

Table 5-3: Component Video Connector Pinouts

5.3 Display Adjustment

Every model in the MMC-2201C is assembled with an ergonomically designed stand. The monitor stand allows for adjustment of the display in multiple directions. The following sections fully describe the display adjustment parameters of the monitor stand.

5.3.1 Height Adjustment

The height of the monitor can be adjusted whether in portrait or landscape position. To adjust the height, hold both sides of the monitor bezel and raise or lower the monitor to the desired height. The total range of movement in the vertical direction for the monitor is 70 mm. The minimum height of the monitor with stand is 276 mm and the maximum height of the monitor with stand is 346 mm.



NOTE:

For optimal viewing and preventing eye fatigue, keep the top of the monitor slightly lower than the viewer's eye so that the line of sight when viewing the monitor is aimed downward.

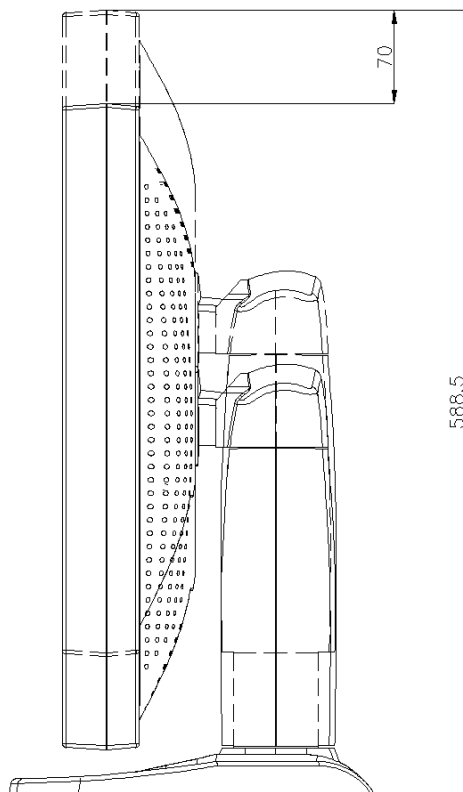


Figure 5-5: Monitor Height Adjustment

MMC-2201C Medical LCD Monitor

5.3.2 Portrait/Landscape Orientation

The monitor can be oriented in either a portrait or landscape position. To adjust the portrait/landscape orientation, hold both sides of the monitor bezel and turn the monitor clockwise or counterclockwise as necessary.

**NOTE:**

To avoid scratching the bezel, raise the monitor to its highest position before rotating it. When the rotation is complete, the on screen display will automatically reorient itself to match the orientation of the monitor.

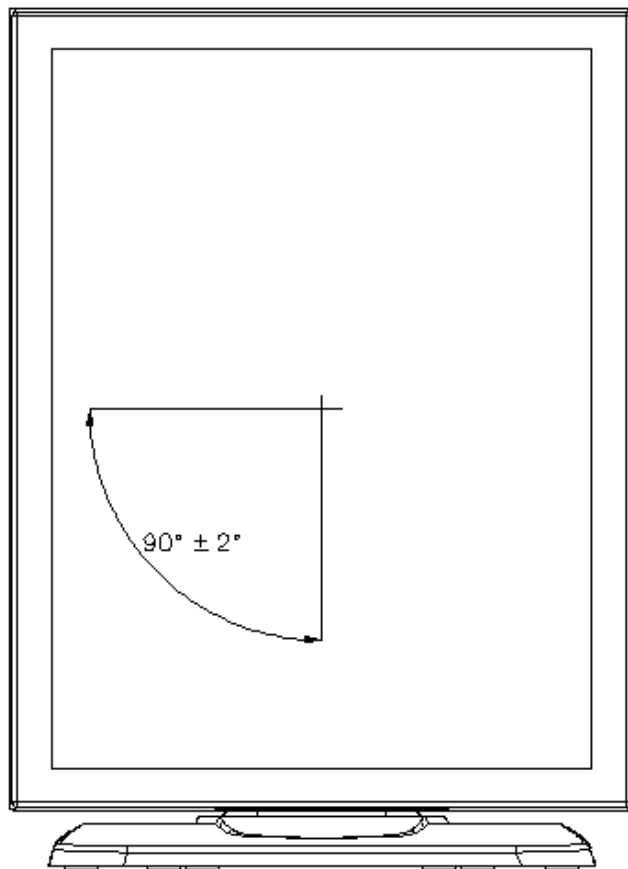


Figure 5-6: Monitor Portrait/Landscape Orientation

5.3.3 Tilt Adjustment

The monitor can be tilted to offer a more comfortable viewing position to the user. The total range of movement is 5° forward from a straight vertical position and 15° backward from a straight vertical position. To adjust the monitor, hold both sides of the monitor bezel and tilt forward or backward as necessary.

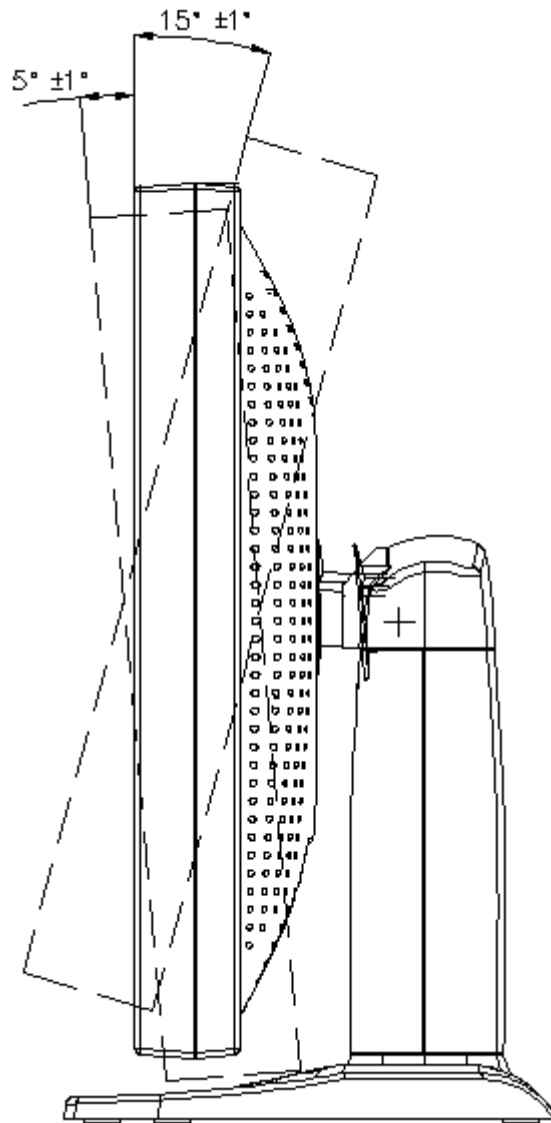


Figure 5-7: Monitor Tilt Adjustment

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5.3.4 Swivel Adjustment

The monitor can be swiveled to offer a more comfortable viewing position to the user. The total range of movement is 90° (45° left or right from a straightforward position). To adjust the monitor, hold both sides of the monitor bezel and swivel left or right as necessary.

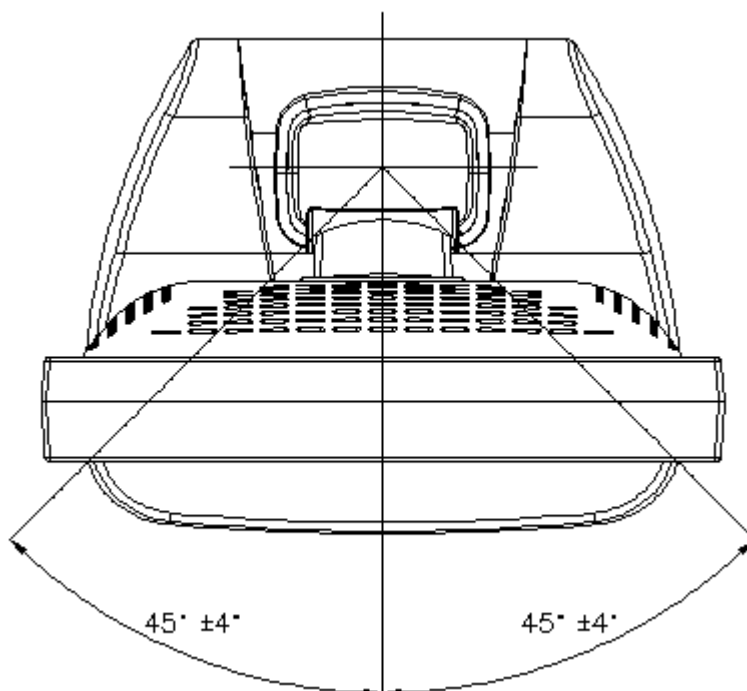


Figure 5-8: Monitor Swivel Adjustment

5.4 Mounting the MMC-2201C

The MMC-2201C can be mounted on a monitor arm or stand.



CAUTION:

When mounting the monitor, take care to tighten the retention screws or bolts until fully secure, but do not over tighten. Over tightening the retention screws or bolts may cause them to become stripped, rendering them useless.

5.4.1 Monitor Arm or Stand Installation

The MMC-2201C has Video Electronics Standards Association (VESA) standard mounting holes tapped into the rear panel. The standard holes are M4 set at 100mm x 100mm apart (Figure 5-9).

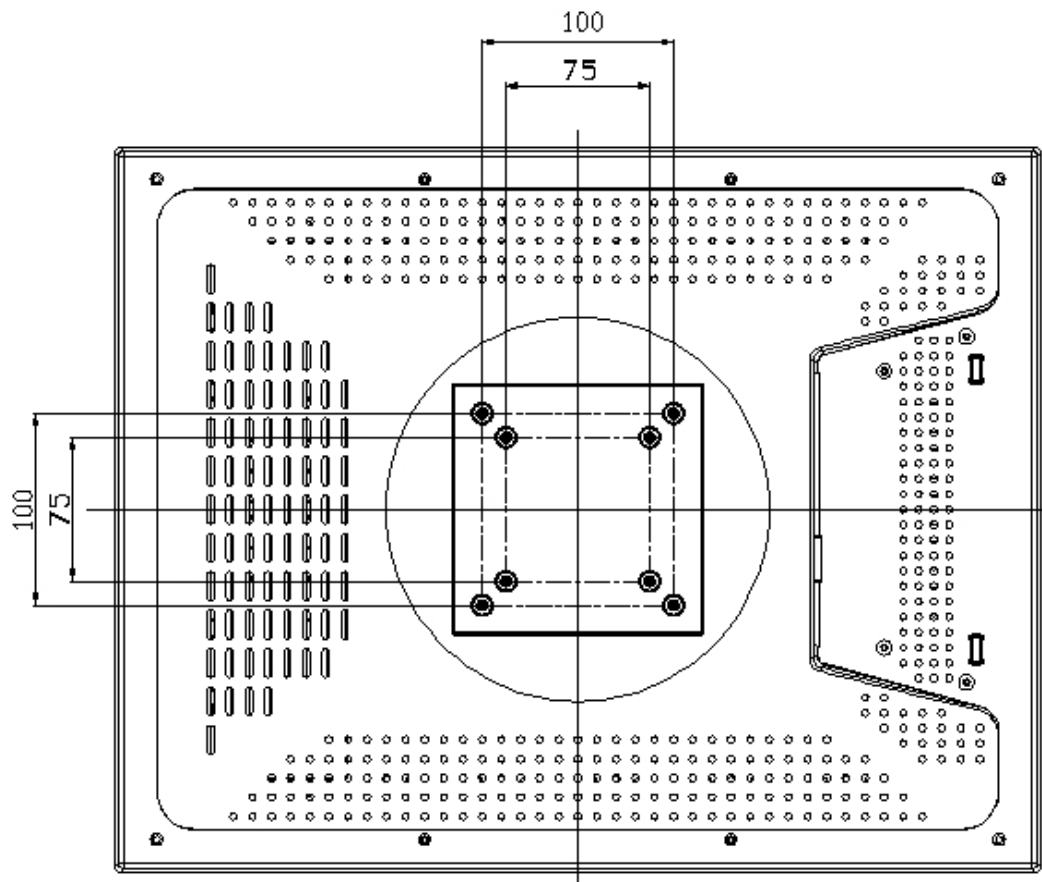


Figure 5-9: VESA Mounting Holes

To mount the MMC-2201C onto a monitor arm or stand, please follow the steps below.

- Step 1:** Line up the threaded holes on the monitor rear panel with the screw holes on the monitor arm or stand mounting plate.
- Step 2:** Secure the monitor to the arm or stand with the retention screws supplied with the monitor arm or stand.

Chapter

6

On-Screen-Display (OSD) Controls

6.1 IEI smartOSD Quick Installation Guide

IEI smartOSD is a proprietary On-Screen-Display (OSD) software solution from IEI that enables easy, remote monitor setting adjustments in a Windows environment. IEI smartOSD delivers excellent performance and provides more flexibility than the typical OSD hardware solutions when adjusting a monitor. smartOSD also allows monitor settings such as brightness, contrast, screen position, size, color gain to be read and changed over normal video cable (VGA or DVI). The smartOSD function is only supported by revision 1.1 models and above.

6.2 Pre-installation Notice

Before installing smartOSD software, please make sure one of the following operating systems is installed:

- Windows 95
- Windows NT 4.0
- Windows 98
- Windows 2000
- Windows 2003
- Windows XP
- Windows Vista

6.3 smartOSD Install

Connect the MMC-2201C to a host computer. Insert the CD that came with the system and follow the instructions below.

Step 1: When the CD install the screen shown in Figure 6-1 appears.

MMC-2201C Medical LCD Monitor



Figure 6-1: smartOSD Installer

Step 2: Click "Smart OSD" in Figure 6-1.

Step 3: The welcome screen shown in Figure 6-2 appears.

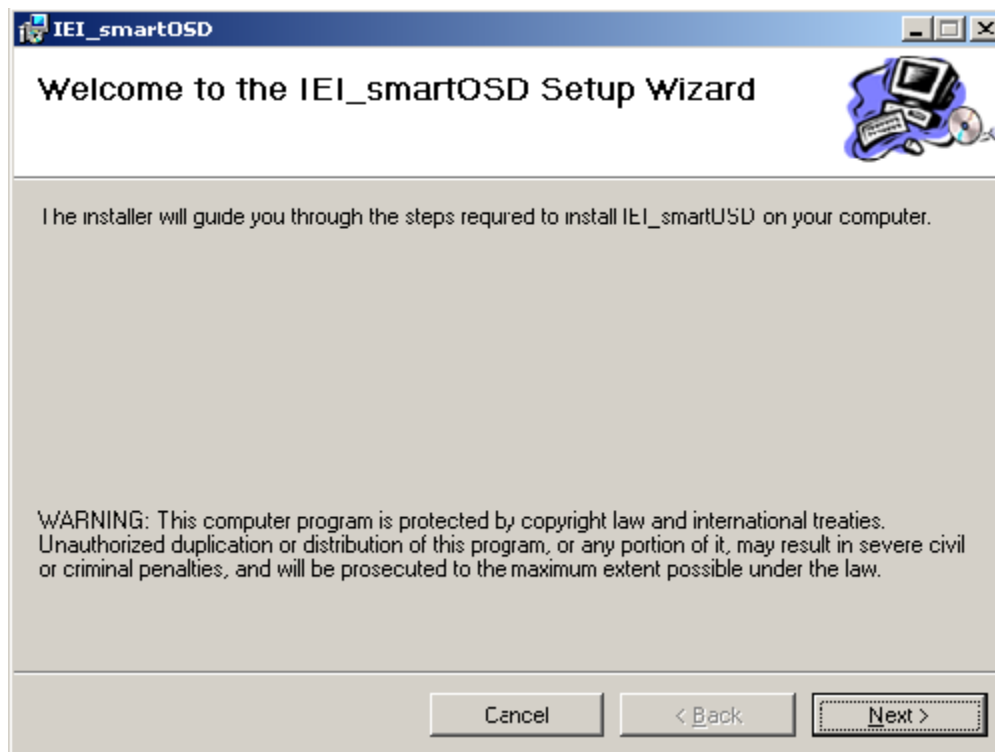


Figure 6-2: smartOSD Welcome Screen

Step 4: Click **Next** to continue.

Step 5: The Folder Select screen in Figure 6-3 appears.

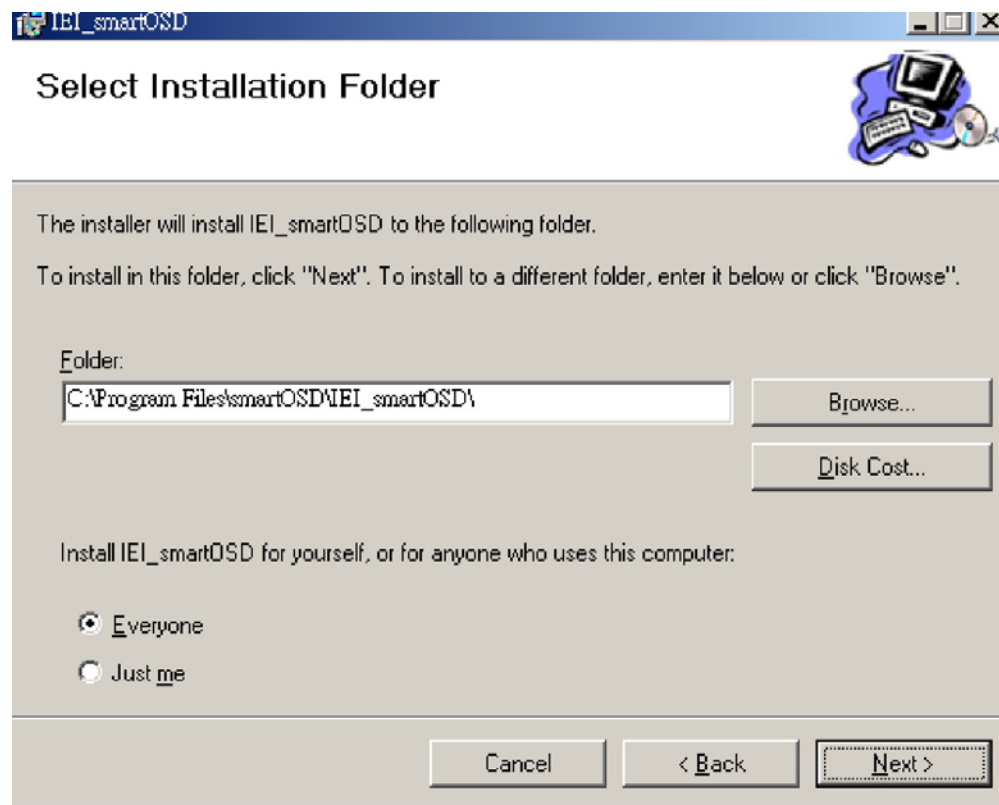


Figure 6-3: smartOSD Folder Select Screen

Step 6: Select the installation folder in Figure 6-3 shown above.

Step 7: Click **Next** to continue.

Step 8: The screen in Figure 6-4 appears.

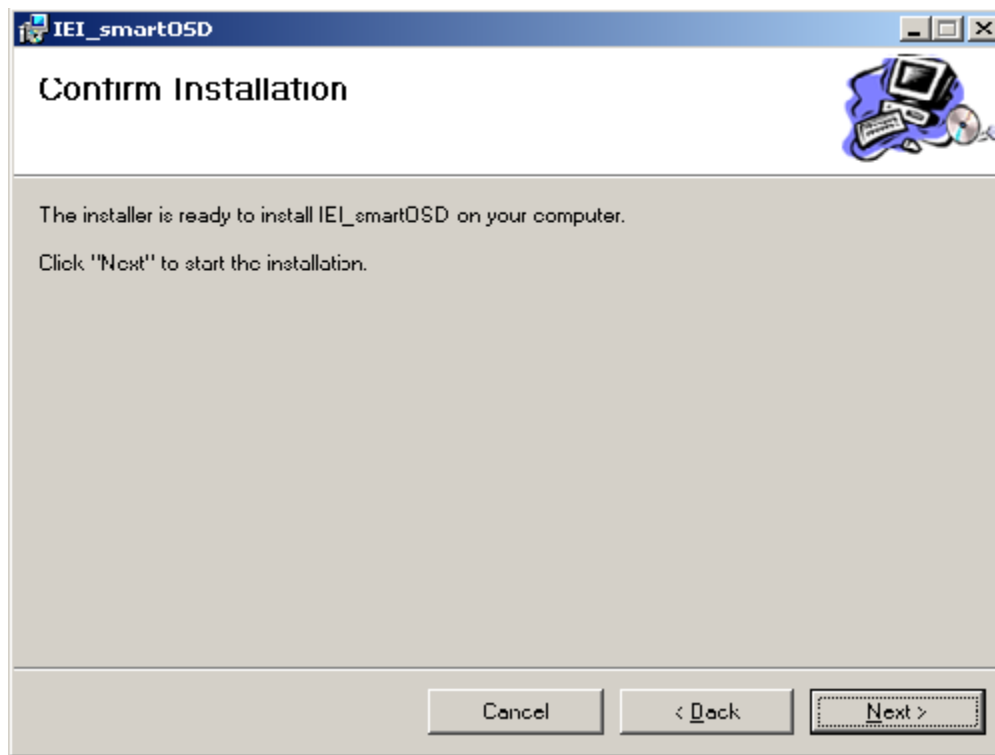


Figure 6-4: smartOSD Confirm Installation

Step 9: Confirm the installation by clicking **Next** in the screen above.

Step 10: The program starts to install and the progress bar shown in Figure 6-5 appears.

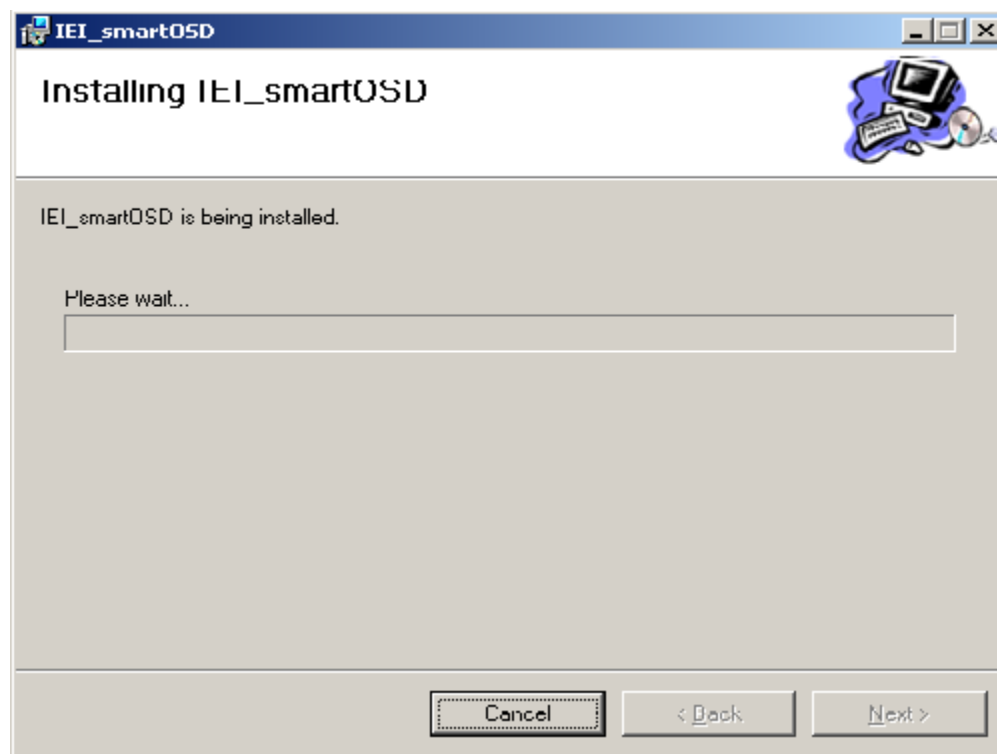


Figure 6-5: smartOSD Installation Progress

Step 11: When the installation is complete the "Complete Installation" screen in Figure 6-6 appears.

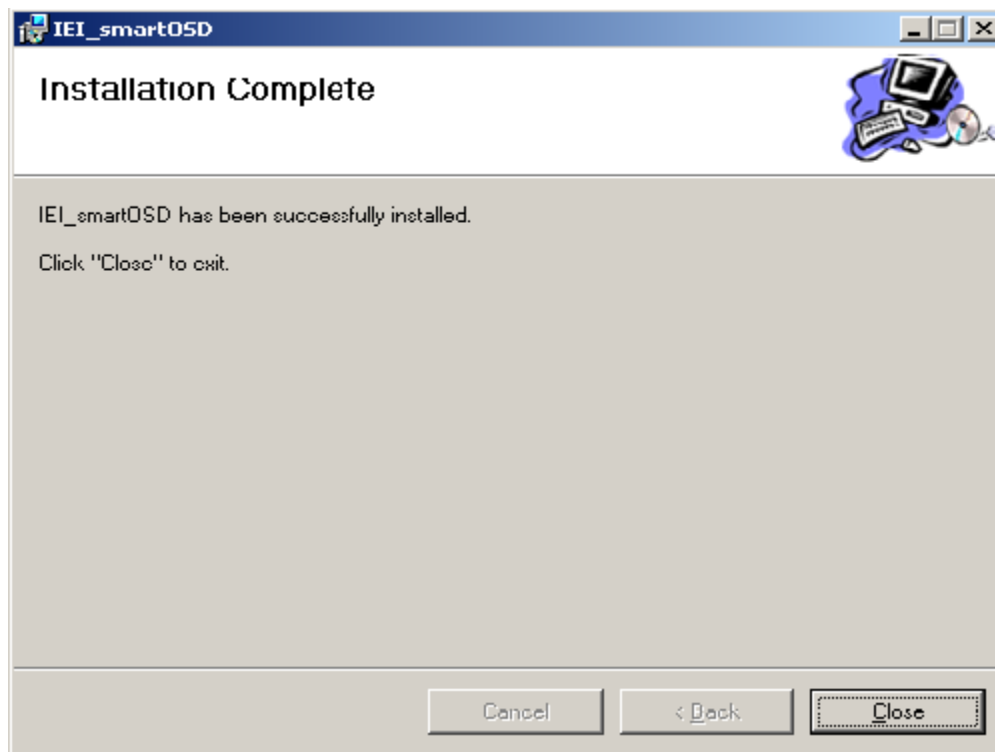


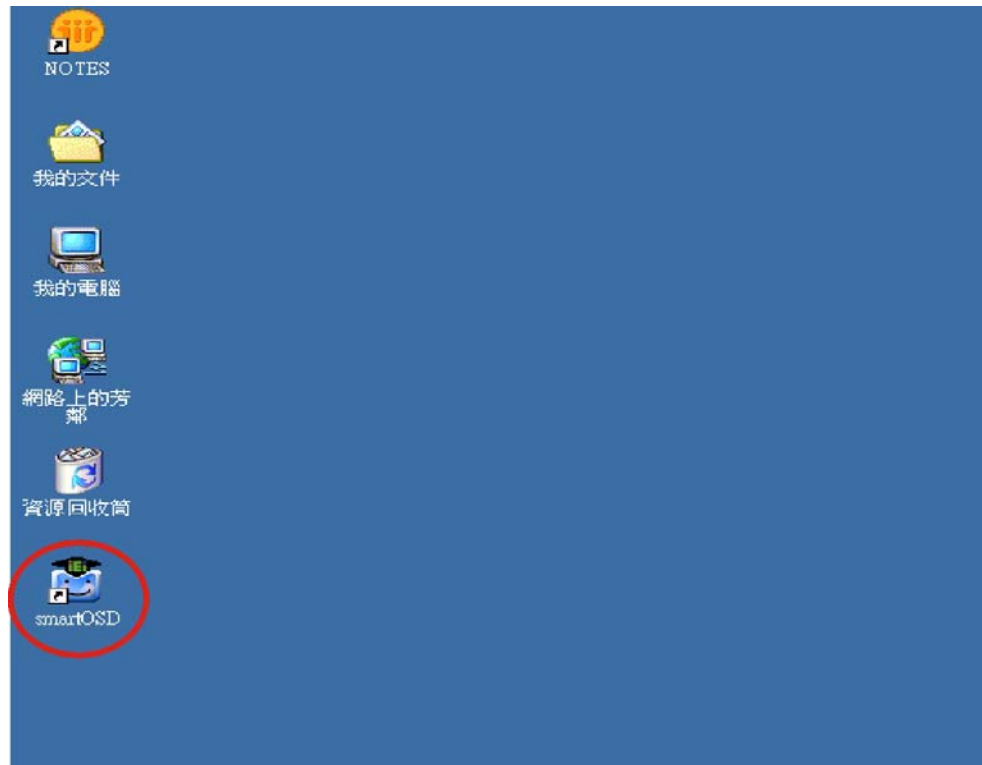
Figure 6-6: smartOSD Installation Complete

Step 12: Click **Close** in the screen above.

Step 13: After quick setup is complete, the IEI smartOSD wizard logo appears on the desktop as shown in the screen below.

Step 14: To access the smartOSD, click the smartOSD wizard logo.

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6.4 smartOSD Menu Structure

The table below shows the smartOSD menu structure for all IEI LCD monitors.

Item	Elements
EDID	EDID contains basic information about the monitor and its capabilities.
Image	Brightness
	Contrast
	Sharpness
Display	Auto Adjust
	Phase
	Clock
Color	Auto Color

	Color Temperature
	Gamma
PIP	PIP
	PIP Source Input
	PIP Size
System	Monitor Power Control (Note2)
	Auto Brightness
	Main Source Input
	Volume
	Misc/OSD Lock/OSD Unlock
	Mute
Management	Memory (Save/Load)
	Power Management

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6.4.1 Manage Page

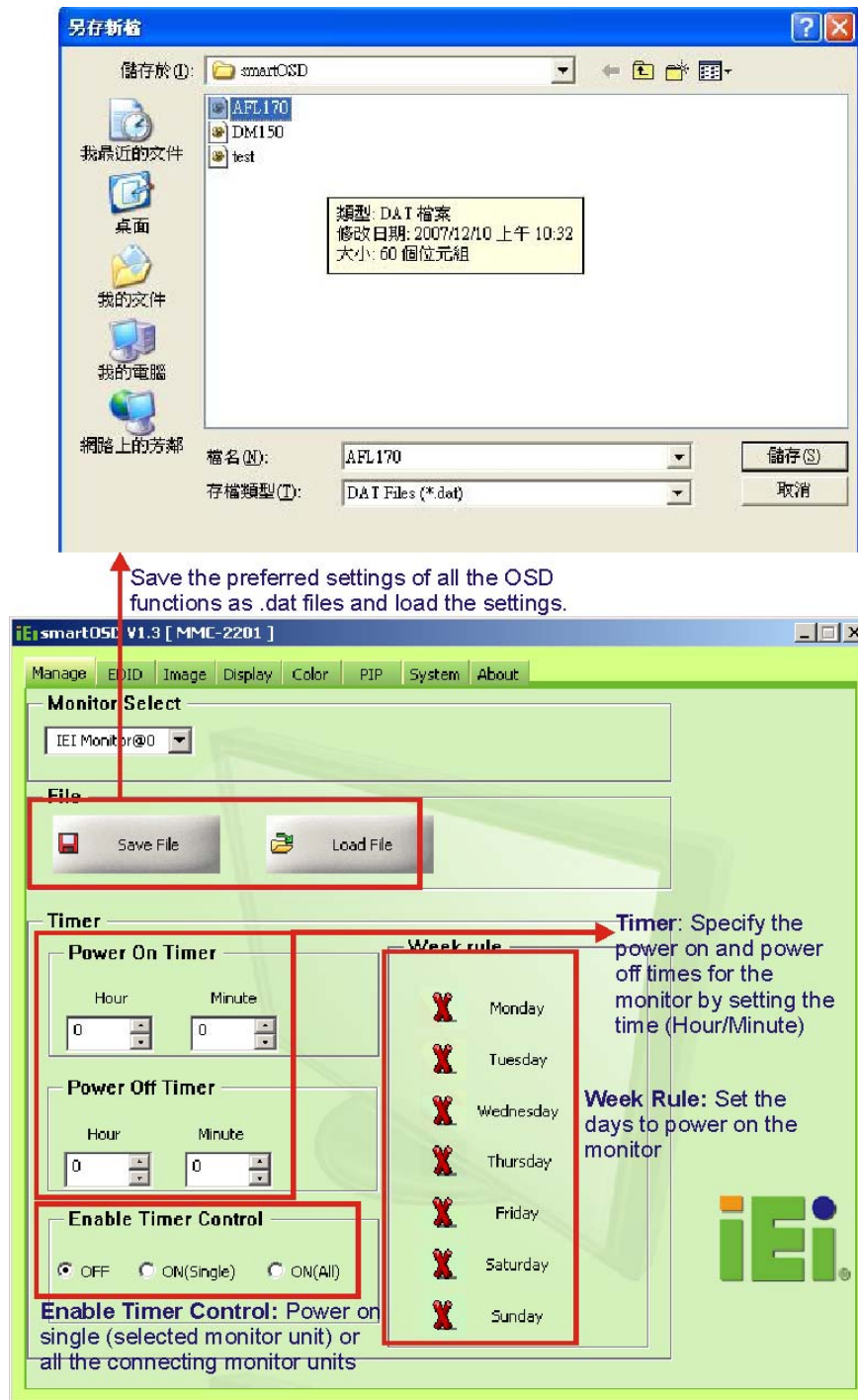


Figure 6-7: Manage Page

6.4.2 EDID Page

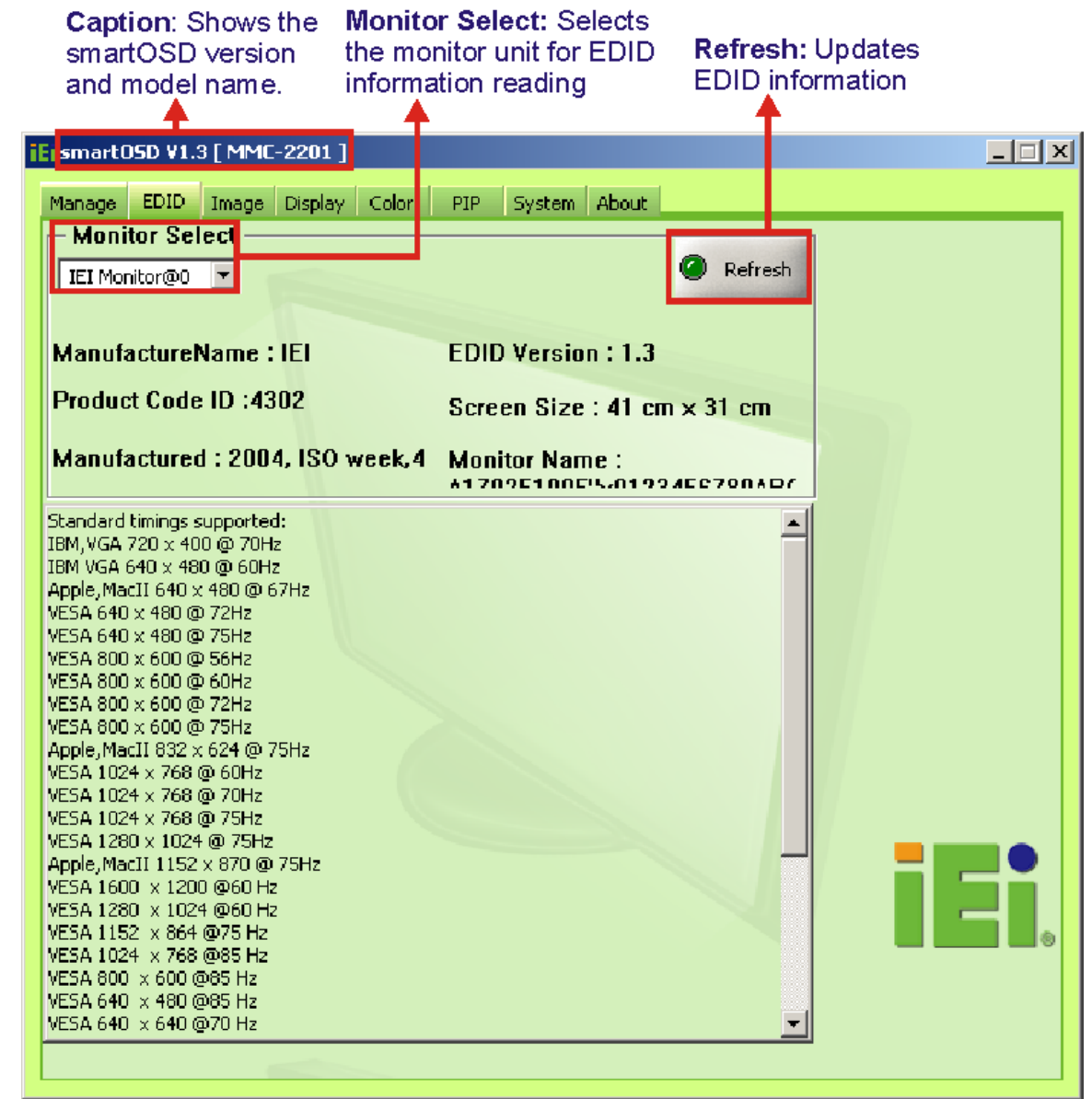


Figure 6-8: EDID Page

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6.4.3 Image Page

Monitor Select: Selects the monitor unit for which the image parameters will be adjusted

Refresh: To update image information which has been affected by the hardware OSD settings

Apply All: Delivering the image parameters settings to all the connecting monitors

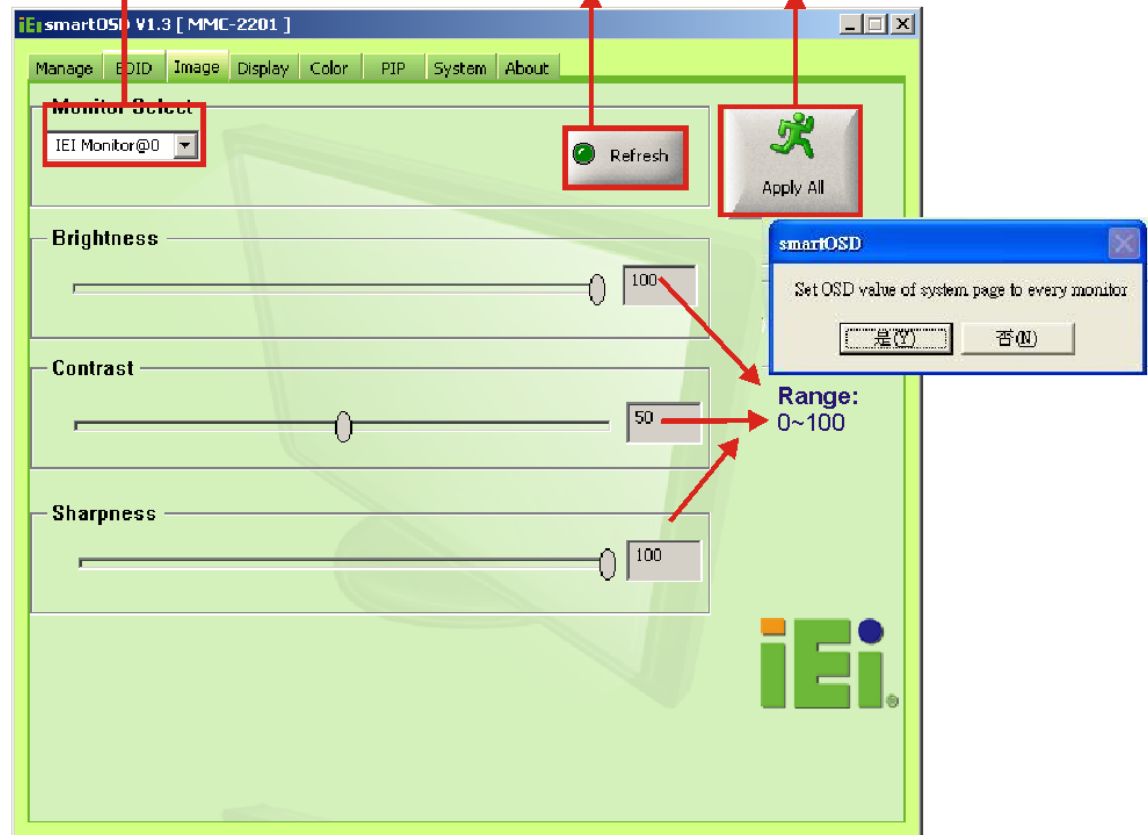


Figure 6-9: Image Page

6.4.4 Display Page (for analog signal)

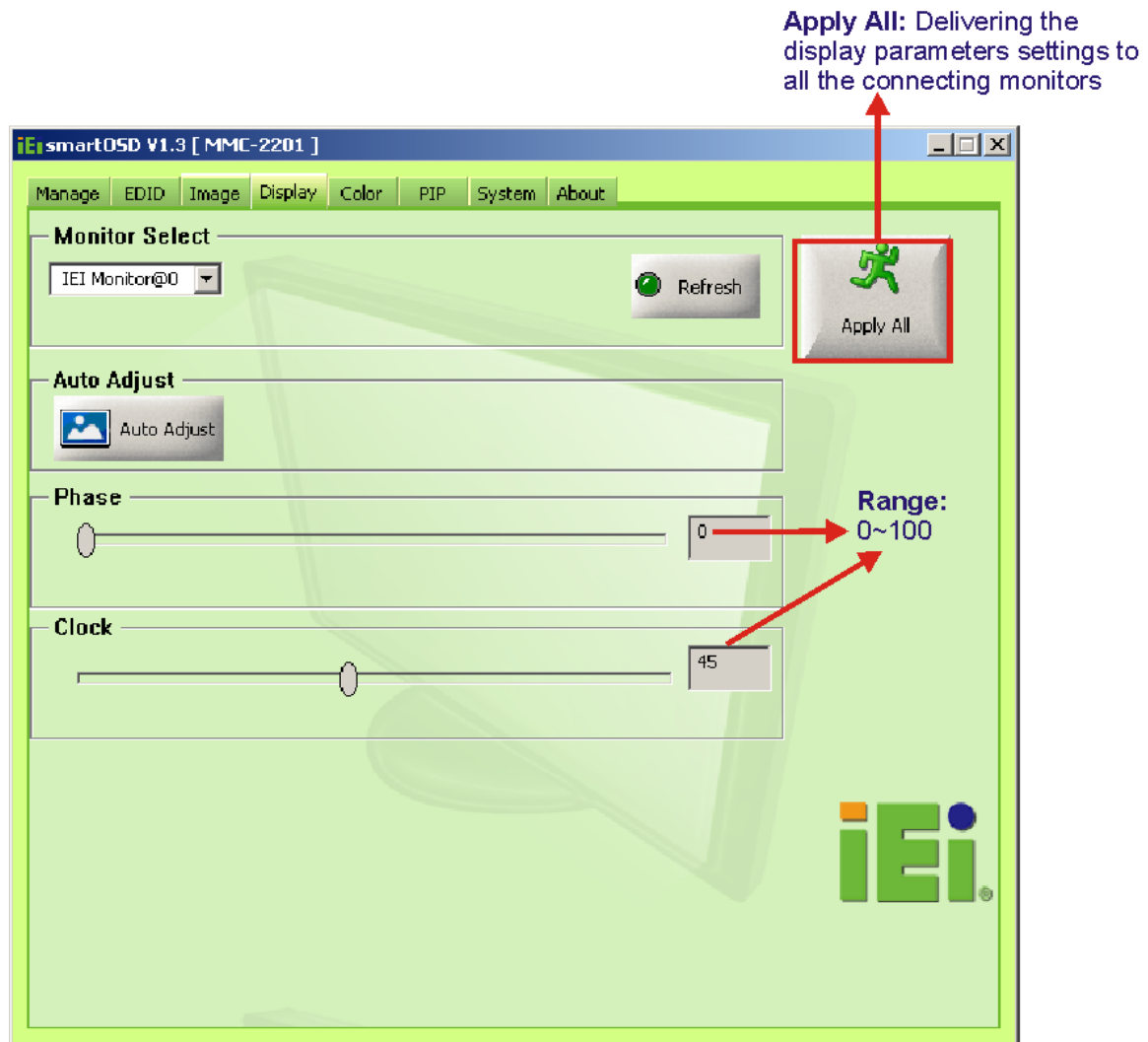


Figure 6-10: Display Page

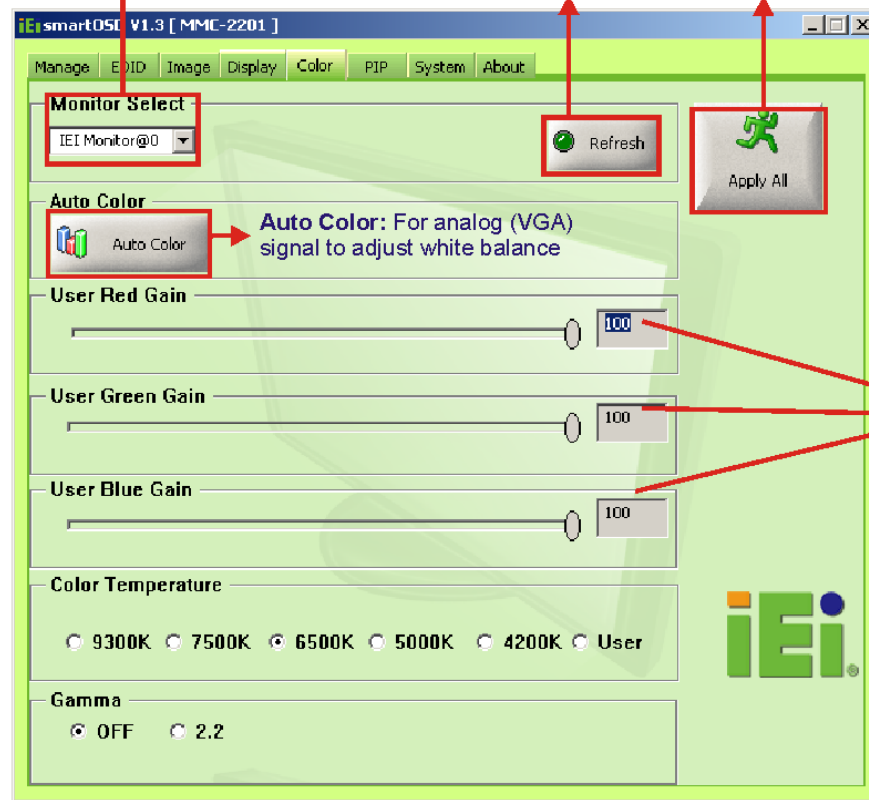
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6.4.5 Color Page

Monitor Select: Selects the monitor unit for which the image parameters will be adjusted

Refresh: To update image information which has been affected by the color OSD settings

Apply All: Delivering the color parameters settings to all the connecting monitors



Range: 0~100 (Values can only be adjusted if user is selected for the Color Temperature)

Figure 6-11: Color Page

6.4.6 PIP Page



Figure 6-12: PIP Page

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6.4.7 System Page

Monitor Select: Selects the monitor unit for which the system parameters will be adjusted

Monitor Power Control: Press ALT+P buttons to boot the monitor again

Apply All: Delivering the system parameter settings to all the connecting monitors

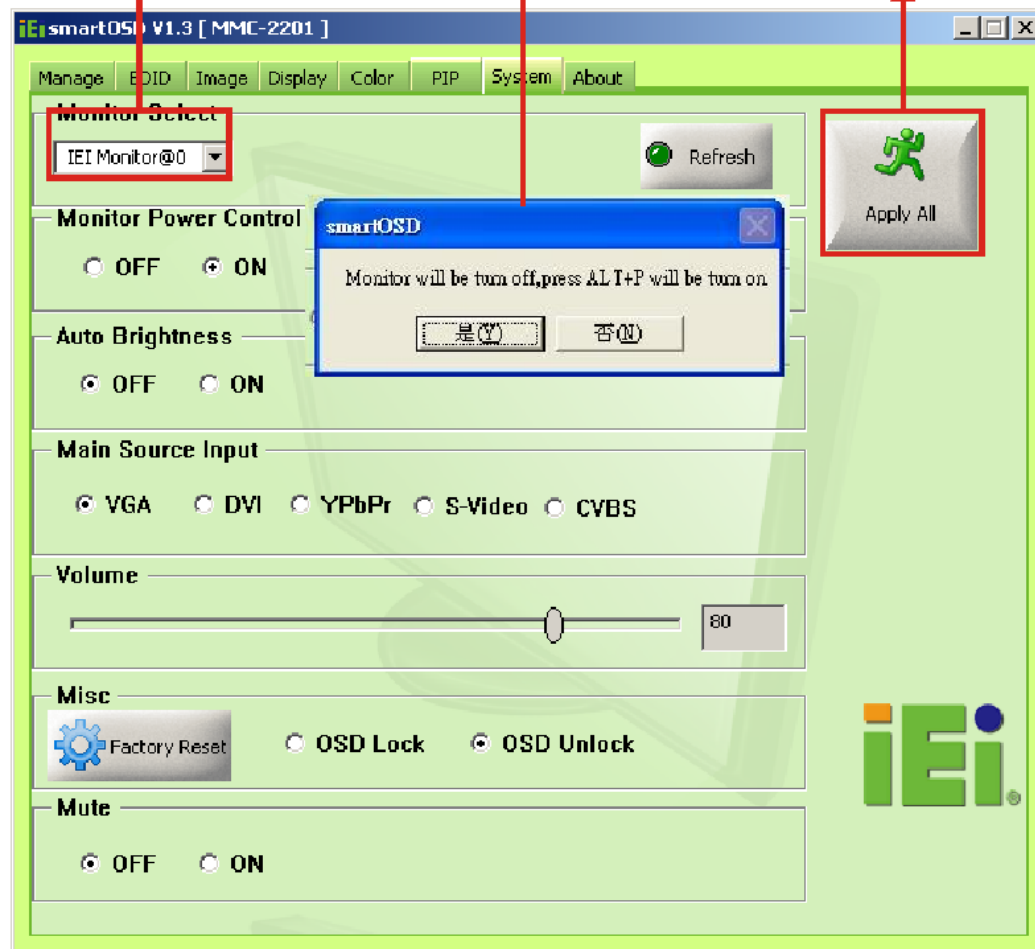


Figure 6-13: System Page

6.4.8 About Page



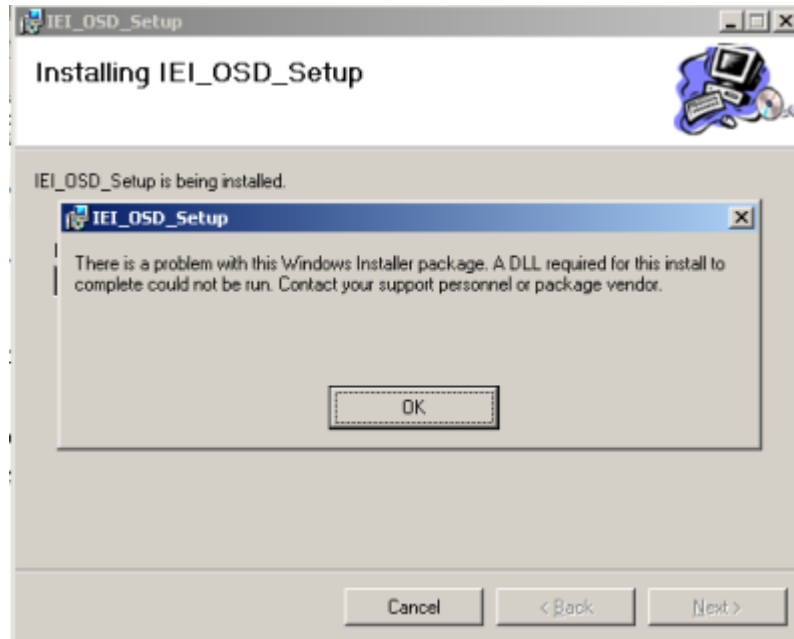
Figure 6-14: About Page

MMC-2201C Medical LCD Monitor

6.5 smartOSD FAQ

For troubleshooting, please see the steps below:

1. **Installation fails under Windows 2000 and shows following image:**

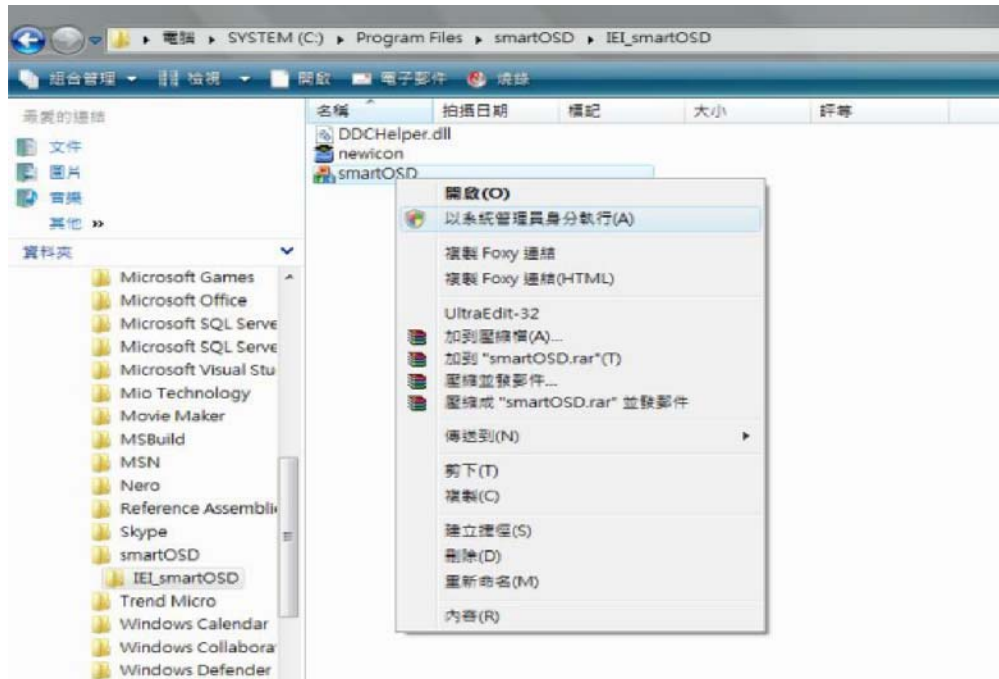


- **Solution:** Download and install service pack Windows Installer 3.1

2. **Installation fail under Vista while showing following image:**



- **Solution:** Install smartOSD.exe as the administrator authority



3. **The Model Fail error message shown below appears.**



- **Solution:** smartOSD only supports firmware version 2.0 and following versions.

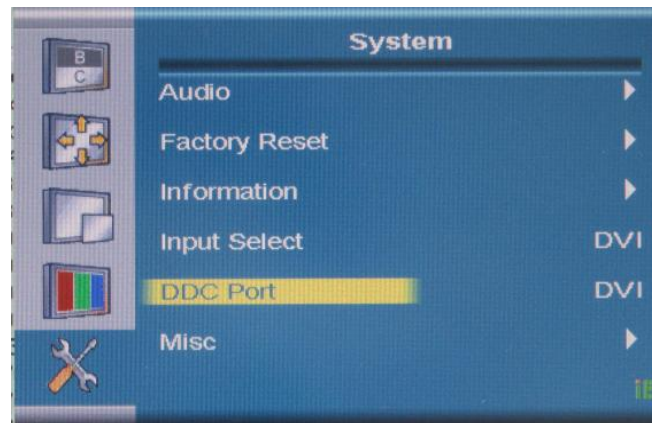
4. **The DDC port fail error message shown below appears.**



- **Solutions:**

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- i. Check VGA or DVI cable
- ii. Check an IEI monitor is being used
- iii. Make sure the version is version 2.3 for the AFOLUX/MDM series and version 1.5 for the DM/TDM/SRM/LCD-KIT series that have the smartOSD functions
- iv. Check the system is connected to the correct port. That is, the system should be connected to the DDC port. (Only for AFOLUX and MDM series)



- v. Check if the OSD control status is busy. A busy signal may cause the signal message for a short time.

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Chapter

7

OSD Keypad

7.1 User Mode OSD Structure

7.1.1 OSD Buttons

There are several on-screen-display (OSD) control buttons. Figure 7-1 shows a typical arrangement of OSD controls.



Figure 7-1: OSD Control Buttons

- **LCD ON/OFF Button**
Press this button to turn the LCD monitor on or off. When the LCD monitor is on, the power LED is turned on in green.
- **Auto Button**
Press this button to enable auto-configuration, apply default values or exit the menu.
- **Menu Button**
Press this button to open the OSD window. When inside a menu, press this button to confirm the function adjustment or selection of the item. There may be several levels in one item. As you select an item in the menu, the sub-items will be displayed.
- **+/- Button**
Use these buttons to change the values of the selected items.
- **Select Button**
Use this button to select different menus or, once a menu is selected, to scroll through the menu.

The OSD control panel also includes one LED.

- **Power LED**
When the LCD monitor backlight is on and a DVI signal is detected, the power LED is green. When the LCD monitor backlight is off or no DVI signal is detected, the power LED is orange.

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7.1.2 OSD Menu Structure

Table 7-1 shows the MMC-2201C OSD menu structure.

Level 0	Level 1	Value		
Image Menu	Brightness	0 to 100		
	Contrast	0 to 100		
	Sharpness	0 to 100		
Display Menu	Auto Adjust	Select		
	Phase	0 to 100		
	Clock	0 to 100		
	Display Control	Display Image	Auto, 1:1, Aspect	
		Aspect Ratio	Auto, 4x3, 14x9, 16x9, >16x9	
		Display Position	Select	
PiP Menu	PiP	On, Off		
	PiP Input Select	VGA, YpbPr, DVI, Svideo, CVBS		
	PiP Size	Small, Medium, Large, Side		
	PiP Position	Select		
	PiP Color Controls	Brightness	0 to 100	
		Contrast	0 to 100	
	Blend	0 to 100		
System Menu	Audio	Mute	On, Off	
		Volume	0 to 100	
	Factory Reset	Select		
	Information	Select		
	Input Select	VGA, YpbPr, DVI, Svideo, CVBS		
	Language	English		
	Misc			
	OSD Configuration	OSD Timer	Off, 5 sec, 10 sec, 15 sec, 20 sec, 25 sec, 30 sec	
		OSD Position	Select	
		OSD Transparency	0 to 100	

		OSD Zoom	0 to 100
	Auto Brightness	Auto Brightness	On
			Off

Table 7-1: OSD Menus

7.2 Using the OSD

OSD menu options are described below.

7.2.1 Image Menu

Image menu options are shown below.

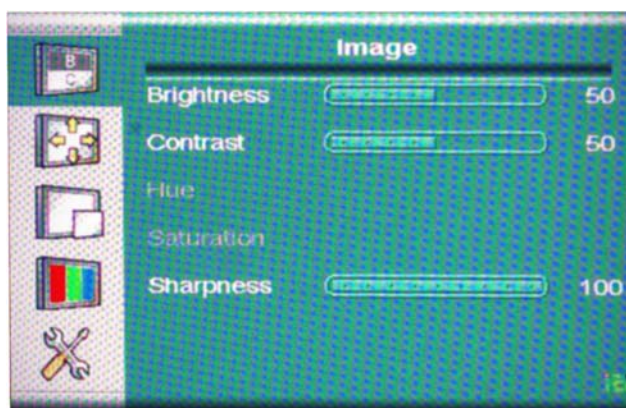


Figure 7-2: Image Menu

Image menu items are described below.

Brightness Adjusts the screen brightness. This function adjusts the offset value of ADC. Setting this value too high or too low will affect the quality of image. When the auto dimming function is turned on, the brightness control is not effective.

Contrast Adjusts the gain value of ADC. Adjusting this value too high or too low will worsen the quality of image.

Sharpness Adjusts the sharpness level. This option may help reduce the softening edges around the displayed objects.

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7.2.2 Display Menu

Display options are shown below.

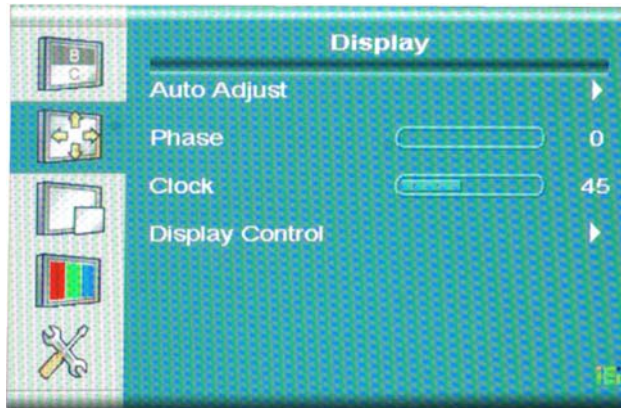


Figure 7-3: Display Menu

Display menu items are described below.

Auto Adjust	Automatically adjusts the LCD screen position.
Phase	Adjusts the input signal (Analog only)
Clock	Adjusts the dot clock position
Display Control	<p>This item allows adjustment of the following items.</p> <p>Display Image – Adjusts the size of the display image</p> <p>Display Position – Adjusts the horizontal and vertical position of the display screen</p>

7.2.3 PiP Menu

The PiP options are shown below.

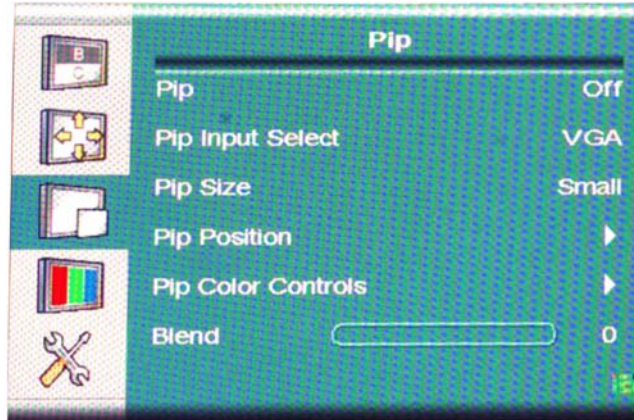


Figure 7-4: PiP Menu

PiP options are described below.

PiP	Turns the Picture-in-Picture feature on or off
PiP Input Select	Selects the display input
PiP Size	Selects the size of the PiP frame
PiP Position	Adjusts the position of the PiP frame
PiP Color Controls	Adjusts the color settings of the PiP frame
Blend	Adjusts blend settings

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7.2.4 System Menu

System options are shown below.

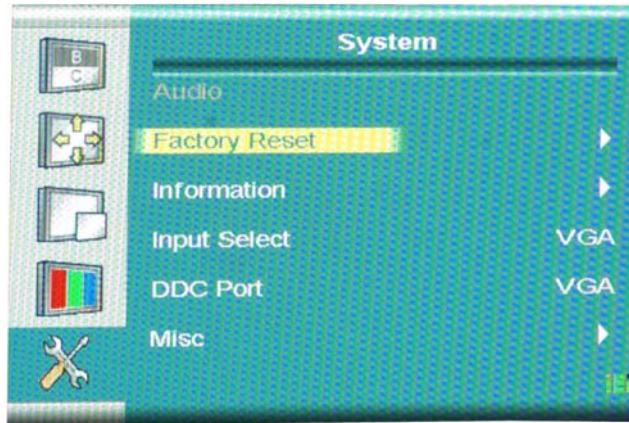


Figure 7-5: System Menu

System options are described below.

Factory Reset Restores the default OSD settings. Note that this will restore all default display settings.

Information Provides information on the LCD monitor, such as model number, input device, and resolution

Input Select Allows selection of input device to use

Language Provides options for selecting OSD screen legends in a preferred language

Misc Provides options for OSD configuration and auto-brightness (auto-dimming)

7.2.4.1 OSD Configuration

OSD configurations are shown below.

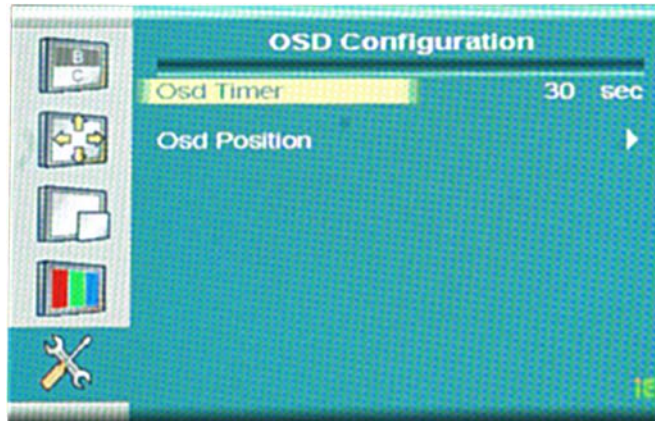


Figure 7-6: OSD Configuration

OSD configuration options are described below.

OSD Timer	Determines how many seconds the OSD screen stays on screen before it disappears when OSD is left unattended.
OSD Position	Adjusts the OSD position on the screen. Use the arrow buttons on the OSD control panel to move the OSD screen
OSD Transparency	Adjusts the transparency of the OSD screen
OSD Zoom	Turns the OSD zoom feature on or off

Chapter

8

Troubleshooting

8.1 Troubleshooting

If a problem persists even after applying the remedies suggested below, please contact an IEI dealer for further examination. Only qualified engineers from certified system integrators are allowed to make necessary functional modifications to the monitor.

Problem	Solution
No picture	<ul style="list-style-type: none"> ▪ Check that the signal cable is completely connected to the graphics card. ▪ Check that the power cord is correctly connected. ▪ Check that the graphics card is firmly seated in its slot. ▪ Check that the power switch of the monitor is ON. ▪ Check that the power switch of the computer is ON. ▪ Check the compatibility of the graphics card with the system and setup a suitable signal timing.
Message appears when the signal is out of input range	<ul style="list-style-type: none"> ▪ Please refer to the user manual of the graphics card for setting up a suitable frequency level.
Power Button does not respond	<ul style="list-style-type: none"> ▪ Turn off the monitor and unplug the power cord from the power outlet. ▪ Plug in the power cord again.
The screen is too bright or too dark	<ul style="list-style-type: none"> ▪ Change the <LUMIN> value in the OSD menu. ▪ The backlight has a fixed life span. When it starts to become dark or begins to flicker, please contact your dealer.
Image Persistence	<ul style="list-style-type: none"> ▪ LCD image persistence isn't a permanent phenomenon, but showing the same image for an extended period of time should still be avoided. ▪ To remove the image, turn off the monitor for as long as the image had been displayed. ▪ Use a screensaver regularly when a monitor is displaying the same image or is idled.
The OSD main menu	<ul style="list-style-type: none"> ▪ Without wearing gloves and with dry hands, try touching

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Problem	Solution
does not appear	<p>the buttons again.</p> <ul style="list-style-type: none"> Press and hold the <Menu> button for 1.5 second or more.
Monitor turns off while in use	<ul style="list-style-type: none"> Make sure the temperature status and fan status indicated in the OSD menus are still within the allowable operating range.
Displayed image is not sized properly	<ul style="list-style-type: none"> Check to see that an appropriate mode is supported by and has been set on the graphics card or system being used.
Displayed Image is unstable	<ul style="list-style-type: none"> Check that the signal cable is properly attached to the system. Check the compatibility of the graphics card and setup a suitable signal timing.

Table 8-1: Troubleshooting

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Appendix

A

Safety Precautions


WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the MMC-2201C.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the MMC-2201C is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the MMC-2201C is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range.***
Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the MMC-2201C chassis is opened when the MMC-2201C is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the MMC-2201C.
- ***If considerable amounts of dust, water, or fluids enter the MMC-2201C,*** turn off the power supply immediately, unplug the power cord, and contact the MMC-2201C vendor.
- **DO NOT:**
 - Drop the MMC-2201C against a hard surface.
 - Strike or exert excessive force onto the LCD panel.
 - Touch any of the LCD panels with a sharp object
 - In a site where the ambient temperature exceeds the rated temperature

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A.1.2 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the MMC-2201C may result in permanent damage to the MMC-2201C and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the MMC-2201C. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the MMC-2201C is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding:*** Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component:*** When handling the electrical component, hold the electrical component by its edges.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the MMC-2201C, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the MMC-2201C, please read the details below.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.

- The interior of the MMC-2201C does not require cleaning. Keep fluids away from the MMC-2201C interior.
- Be cautious of all small removable components when vacuuming the MMC-2201C.
- Turn the MMC-2201C off before cleaning the MMC-2201C.
- Never drop any objects or liquids through the openings of the MMC-2201C.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the MMC-2201C.
- Avoid eating, drinking and smoking within vicinity of the MMC-2201C.

A.2.2 Cleaning Tools

Some components in the MMC-2201C may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the MMC-2201C.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the MMC-2201C.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the MMC-2201C.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the MMC-2201C as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the MMC-2201C. Dust and dirt can restrict the airflow in the MMC-2201C and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

Glossary

Active-Matrix Liquid Crystal Displays

A type of flat panel display with advantages such as light weight, excellent image quality, wide color gamut and response time as compare with other types of displays. Whereas a passive matrix display uses a simple conductive grid to deliver current to the liquid crystals in the target area, an active matrix display uses a grid of transistors and capacitors with the ability to hold a charge for a limited period of time. Because of the switching action of transistors, only the desired pixel receives a charge, and the pixel acts as a capacitor to hold the charge until the next refresh cycle, improving image quality over a passive matrix.

Color Gamut

The complete range of hues and strengths of colors that can be achieved with a given set of colorants such as cyan, magenta, yellow, and black inks on a specific substrate.

Color Space

A three-dimensional space or model into which the three attributes of a color can be represented, plotted, or recorded. These attributes are usually called hue, value, and chroma. The most common color space based on the RGB model being used is sRGB.

Flicker

Flicker is visible fading between image frames displayed on CRT based monitor. Flicker occurs when the monitor's CRT is driven at a low refresh rate, allowing the screen's phosphors to lose their excitation between sweeps of the electron gun. For example, if a CRT monitor's vertical refresh rate is set to 60 Hz, most monitors will produce a visible "flickering" effect. Most people find that refresh rate of 70-80 Hz and above enable flicker-free viewing. Since flat panel displays use Active-matrix liquid crystal displays that use a transistor for each pixel, they do not flicker based on the screen refresh rate. However, Active-matrix liquid crystal displays may display backlight flicker.

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Gamma Correction

In reference to displaying an image accurately on a computer screen, Gamma correction controls the overall brightness of an image. Images that are not properly corrected can look either bleached out, or too dark.

Grayscale

Displayed images of this sort are typically composed of shades of gray, varying from black at the weakest intensity to white at the strongest. Grayscale images are distinct from black-and-white images, which show with only two colors, black and white; grayscale images have many shades of gray in between. Grayscale images intended for visual display are typically stored with 8 bits per pixel, which allows 256 intensities to be recorded. Technical uses (e.g. in medical imaging) often require more levels (typically 10 or 12 bits per pixel), to make full use of the sensor accuracy.

Refresh Rate vs. Frame Rate

The refresh rate is the number of times in a second that a display is illuminated. This is distinct from the measure of frame rate in that the refresh rate includes the repeated illumination of identical frames, while frame rate measures how often a display can change from one image to another.

Response Time

Response time is the amount of time a pixel in an LCD monitor takes to go from active (black) to inactive (white) and back to active (black) again. It is measured in milliseconds (ms). Lower numbers mean faster transitions and therefore fewer visible image artifacts.

White Point (White Chromaticity)

The intensity and colour temperature of the brightest white reproducible by a device. For a monitor this is the colour and intensity when red, green and blue guns are generating their highest output simultaneously.

Appendix

C

Hazardous Materials Disclosure

C.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

MMC-2201C Medical LCD Monitor

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O
<p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006</p>						

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
<p>O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。</p>						



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